

July 24, 1997

SECY-97-160

FOR: The Commissioners

FROM: L. Joseph Callan /s/  
Executive Director for Operations

SUBJECT: STAFF REVIEW OF LICENSEE RESPONSES TO THE 10 CFR  
50.54(f)  
REQUEST REGARDING THE ADEQUACY AND AVAILABILITY OF  
DESIGN BASES INFORMATION

PURPOSE:

To inform the Commission of the follow-up activities resulting from the staff's review of licensee responses to the 10 CFR 50.54(f) request regarding the adequacy and availability of design bases information, issued on October 9, 1996. In addition, this paper also provides the staff's response to Staff Requirements Memorandum dated March 17, 1997, regarding (1) the resources necessary to perform the follow-up to the 10 CFR 50.54(f) letter in addition to normal inspection activities, and (2) the staff and contractor resources that will be devoted to the new engineering inspection procedure used to assess licensee engineering effectiveness, with a comparison of resources required prior to the addition of the new procedure.

BACKGROUND:

As previously discussed in SECY-96-189, in the mid - to late 1980s, NRC team inspections began to identify concerns that design bases information was not being properly maintained and that plants were being modified without the licensee having an understanding of the plant's design bases. As a result, the NRC took several actions to address these concerns. The staff conducted a survey in 1989 of nuclear power plant design control practices and design reconstitution efforts at six utilities and one steam supply vendor (NUREG-1397, "An Assessment of Design Control Practices and

Design

Contact: D. Solorio, NRR  
415-1973

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Reconstitution Programs in the Nuclear Industry"), issued a policy statement ("Availability and Adequacy of Design Bases Information at Nuclear Power Plants," August 10, 1992), and published for comment a draft Generic Letter ("Availability and Adequacy of Design Bases Information"). In addition, because the NRC's findings heightened the nuclear industry's awareness of the need to improve the adequacy and availability of design documentation, the Nuclear Management and Resources Council (NUMARC) also took steps to assist licensees by issuing NUMARC 90-12, "Design Basis Program Guidelines." This document presented guidance to those licensees that undertook NUMARC's voluntary initiative to develop a program to collect and organize design bases and supporting design information.

In 1995, concerns re-emerged, most prominently at Millstone and then at other facilities, regarding the ability of licensees to operate their facilities in accordance with the facility's design bases. Considering the potential scope of these re-emerging concerns and the need to ascertain the extent of the problems within the entire population of operating reactors, the staff requested licensees to describe their programs and processes for ensuring their ability to operate their facilities in accordance with the facility's design bases. Following Commission approval (SRM October 1, 1996, approving SECY-96-189), the NRC issued a letter in accordance with 10 CFR 50.54(f) to each reactor licensee's Chief Executive Officer in October 1996, requesting reactor licensees to describe their programs and processes established to control and maintain operations within their facility's design bases. Additionally, licensees were also asked to discuss the

effectiveness of these programs and processes, including a discussion of any design bases documentation initiatives they had implemented. NRC staff has reviewed all the responses.

In a February 25, 1997, memorandum from the Executive Director for Operations to the Commission, the staff described its review approach and review guidance that would be used to complete the review of licensee responses to the 10 CFR 50.54(f) request.

In a Staff Requirements Memorandum (SRM) dated March 17, 1997, the Commission asked the staff to report to the Commission: (1) the resources, in dollars and full time equivalent positions, necessary to perform the followup to the 10 CFR 50.54(f) request in addition to the normal inspection activities, and (2) the staff and contractor resources that will be devoted to the new engineering inspection procedure (9380X), and how they compare with resources required before the new vertical slice approach was initiated. This paper also contains the staff responses to these two requests.

#### SUMMARY:

The staff reviewed all licensee responses to the 10 CFR 50.54(f) request in accordance with the staff's review criteria and concluded that all licensees required to respond have established programs and processes to maintain their facility's design. Additionally, the staff determined that no further generic action was required. However, the staff identified that there was a need for further plant-specific followup because of instances where: (1) a licensee's regulatory performance brought into question the effectiveness of its design

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control programs and processes, or (2) the staff determined there was a need to validate the effectiveness of a particular element of a licensee's design control programs and processes. The review also provided the staff with data that will be

used to prioritize staff  
followup activities.

DISCUSSION:

Review Implementation Plan

As described in a February 25, 1997, memorandum from the Executive Director for Operations to the Commission, the staff developed a four-phase approach in the review of licensee responses to the 10 CFR 50.54(f) request. The staff's approach was based on two guiding principles to govern the review of the licensee responses.

ù The results from the reviews needed to be integrated with NRC's current inspection program in order to facilitate prioritization of any followup activities. To this end, the regions were assigned responsibility for managing and completing the reviews. In addition, NRR would support the review by committing each plant's project manager to the review activity.

ù The staff needed to develop detailed review criteria to ensure consistent results among staff reviewers.

The first three phases were completed by April 17, 1997. Project managers completed the Phase 1 acceptance review to identify significant regulatory concerns requiring prompt NRC followup and to determine whether licensees had provided the requested information. The project managers completed Phase 1 without needing to request additional information from licensees to support the subsequent review efforts. The pilot phase, Phase 2, involved reviewing one licensee response per region to work through the preliminary review process and review criteria. Phase 2 results were discussed in a March 19, 1997, memorandum from the Executive Director for Operations to the Commission. Following the pilot process, the review process and the review criteria were modified and used to evaluate the remaining responses to the 10 CFR 50.54(f) request. The remainder of this paper focuses on Phase 3: review of the remaining licensee responses and planning of the subsequent followup activities (previously described as Phase 4).

Review Process (Phase 3)

In Phase 3, a review team, composed of a regional engineering inspector, the NRC project manager, and the NRC resident inspector, reviewed a licensee's response, prepared a written summary of the review, and presented the findings and recommendations for

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followup activities during the regional plant performance review (PPR) meetings. The review teams used a review template that had been developed for reviewing the responses to the 10 CFR 50.54(f) request. The review template was organized into three sections, each section having specific review criteria. The first section required the reviewers to determine if the licensee: provided the required information, performed some type of design bases reconstitution effort or had formally organized their design bases information, completed corrective actions that may have resulted from design bases reconstitution or organization efforts, evaluated the effectiveness of its ability to operate its facility in accordance with the facility's design bases, initiated additional actions as a result of preparing its response to the 10 CFR 50.54(f) request or any other previously initiated effort related to maintaining or verifying its facility's design bases, and validated its final safety analysis report (FSAR) or submitted an improved technical specification application. The second section required the reviewers to: identify inconsistencies between a licensee's response and the staff's understanding of the licensee's design basis regulatory history, identify significant new information that needed clarification or confirmation, highlight unexplained topics or missing information, and identify significant trends observed with respect to design bases performance within the last few years. The third section required the reviewers to recommend the need for: a design team inspection, a change to

the current inspection plan for the facility, a change in the focus of currently planned inspections at the facility, or any other appropriate followup action. A copy of the guidance document used for the reviews is attached to the March 19, 1997, memorandum from the Executive Director for Operations to the Commission.

At the PPR meetings, the regions integrated regulatory performance insights gained through the inspection program with the information provided by the licensees in their responses in order to determine the need for and priority of further plant specific followup. Each regional administrator then presented the findings and recommendations for their region at the senior management screening meetings held in preparation for the June 1997 senior management meeting.

#### Staff Review of Licensee Responses - Summary

The following findings were summarized by the review teams following their review of the licensee responses to the 10 CFR 50.54(f) request.

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ù Licensees submitted listings or discussions (or both) of design control programs and processes to support their general statements that they had reasonable confidence that the design bases for their facilities were implemented and maintained.

ù Licensees were generally responsive with respect to addressing questions; however, the review teams in some instances determined there was a need to validate the effectiveness of a particular element of a licensee's design control programs and processes.

ù Most licensees had at least initiated some type of activity to retrieve or collect design bases information; however, the depth and scope varied significantly, and most responses failed to discuss the nature of the findings from these efforts.

ù Although many licensees may have initiated a design bases documentation effort,  
the information was not always validated.

ù A significant number of licensee responses indicated that licensees were performing  
additional activities, either to validate the effectiveness of their design control  
programs and processes or to improve some aspect of their programs and processes  
as a result of previously identified weaknesses.

ù A number of licensees indicated that through the performance of internal reviews  
initiated within the last several years or as a result of preparing their response to the  
NRC s request, they identified weaknesses in design control programs or processes  
that warranted additional corrective actions. However, details that the staff needed  
in order to evaluate the scope of these weaknesses were frequently not provided.

ù A significant number of licensees indicated they had initiated some form of a FSAR  
review effort (many licensees stated that the reviews were being performed in  
accordance with Nuclear Energy Institute FSAR review guidelines).

ù A significant percentage of licensees indicated they were planning to submit or had  
submitted improved technical specification applications.

ù Some licensees stated that they had performed vertical slice assessments to verify  
the effectiveness of their design control programs and processes.

ù The staff recognized that licensees expended significant efforts to prepare their  
responses.

#### Followup Activities (Phase 4)

Specific actions for Phase 4 were not provided in the February 25, 1997, memorandum from the Executive Director for Operations to the Commission. At that time, the staff thought that it might be appropriate to conduct a more in-depth review of available regulatory information than was done in Phase 3, with insights gained in the review of the licensee responses. As a result of reviewing licensee responses, the staff concluded that for instances where concerns remained regarding a licensee's design performance, inspection resources would be focused to validate or verify the effectiveness of a licensee's design control programs and processes.

Overall, several types of followup activities were identified from the three-phase review process. In addition, there were detailed, facility-specific recommendations made to focus the review on a particular aspect of a licensee's design control programs or processes. In general, the basis for recommending the followup activities most frequently came from one of two concerns: either the staff determined (1) that a licensee's regulatory performance raised questions about the effectiveness of programs and processes for controlling its facility's design bases, or (2) there was a need to validate the effectiveness of a particular element of a licensee's design control programs and processes. The following is a summary of some of the most frequently recommended followup activities made by the review teams.

ù Design team inspections (also known as architect-engineer teams) were initially recommended at varying priority levels for roughly a third of the sites. Of note, some sites had been slated for a design team inspection before a licensee's response was reviewed. In some cases, the review of a licensee's response confirmed the need for the team inspection. In other instances, the staff is reevaluating the need for the team inspection.

ù Because of similarities between a design team inspection and

a safety system functional inspection, also known as vertical slice inspections, safety system functional inspections were also recommended as a first priority. In other instances, a safety system functional inspection was recommended in the event that a design team inspection could not be performed.

ù Regional team inspections, such as the safety system engineering inspection, were recommended to be augmented to specifically review some aspect of a licensee s design control program.

ù Routine inspections were recommended to be augmented to (1) review the scope of a licensee efforts to compile design bases documentation (DBD), and open items that resulted from DBD or validation efforts, (2) review licensee FSAR review efforts or resulting open items, (3) review licensee corrective actions to address

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weaknesses in design control programs and processes identified during recent initiatives, (4) review specific elements of design bases programs as stated in licensee responses, and (5) review licensee vertical slice reviews (modeled after NRC vertical slice inspections).

ù For licensees currently subject to additional NRC oversight initiatives, or for licensees that had recently implemented significant process improvements in their design control programs and processes, the staff concluded that a major team inspection that may have otherwise been warranted could be temporarily deferred. This will either allow time for improvements to take effect or for termination of the special NRC oversight initiatives that were expected to review the effectiveness of the licensee s design control programs and processes.

These followup recommendations will be tracked through the regional

inspection planning systems, and the necessity for these activities will be periodically reevaluated during regional PPR meetings.

#### Long Term Followup

The staff has determined, based on the results of the reviews and the design bases team inspections conducted to date that there is a need to continue the increased emphasis on inspection of licensee conformance with design bases. Therefore, the staff will implement a change to the normal (core) reactor inspection program by providing an inspection procedure that can be used to evaluate licensee design control programs and processes. This new procedure, Safety System Engineering Inspection (Inspection Procedure 9380X), provides an alternative method to assess a licensee's engineering effectiveness through an in-depth review of engineering calculations as well as other engineering activities and analyses.

Because the findings for the six design team inspections conducted by the staff to date have validated the issues that originated the program and are similar to the issues that led to the 1992 NRC policy statement regarding the availability and adequacy of design bases information, the staff concluded that current inspection procedures such as Engineering and Safety System Functional Inspection as well as the new engineering procedure Safety System Engineering Inspection would provide similar results. The focus of the Safety System Functional Inspection and the Safety System Engineering Inspection is similar to the focus of the design team inspection but the inspections are smaller in scope. When implemented these inspection procedures will allow the staff to inspect a larger number of sites using current inspection resources. However, the staff still plans to use the design team inspections, through fiscal year 1998, when a more intensive design bases inspection is recommended. During 1998, the staff plans to review the findings from the design inspection program to determine the need to continue the program in the following fiscal years. The results from these inspections will continue to be discussed during

regional and NRR management meetings to ensure the NRC maintains an integrated approach in evaluating licensee design performance.

#### Safety System Engineering Inspection Procedure

In an SRM dated March 17, 1997, the staff was asked to submit information on the staff and contractor resources that will be devoted to the new engineering Inspection Procedure (IP) 9380X, and to discuss how they compare with resources required before the addition of the new vertical slice approach.

As discussed previously, the core inspection program will be revised to allow the Regions to perform the new core engineering IP 9380X (Safety System Engineering Inspection). The inspection program will also be revised to allow the conduct of a full Safety System Functional Inspection, that is, a broad review of multiple systems using the Safety System Functional Inspection to fulfill the core inspection requirement for the engineering area. These revisions will give the regions increased flexibility in the selection of the appropriate engineering inspection methodology.

No additional NRC staff resources are estimated to be required to complete the new core inspection, IP 9380X. This estimate is based on limiting the new vertical slice inspection to one system and on utilizing the NRC staff resources currently allocated for completing the current core engineering inspection procedure IP 37550.

However, contractor resources may be required to perform IP 9380X. It is anticipated that one contractor may be required to support completion of IP 9380X for each inspection. The contractor would provide systems design engineering expertise. If half of the reactor sites receive the new core inspection each year, it is estimated that \$1.4 million dollars would be needed each year.

#### Resources Spent and Projected

To date, 3.6 full-time equivalents (FTE) equal to approximately \$343,000 in salaries and benefits were spent reviewing the 10 CFR 50.54(f) responses and planning

the subsequent  
followup.

Overall, sufficient resources are budgeted to implement the followup recommendations because regional normal engineering resources are being used for the majority of the followup activities. NRR has budgeted 176 direct full time equivalent positions and \$3.8 million dollars for inspection program support funds in fiscal year 1998. These resources include funding for Safety System Engineering Inspections, and Safety System Functional Inspections, and design team inspections.

Initially, approximately one-third of the sites were recommended at varying priority levels for a design team inspection based on the staff's review of licensee responses to the  
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10 CFR 50.54(f) request. These sites were then prioritized by regional and program office senior management, considering other ongoing NRC inspection activities, and 11 sites were then recommended as a higher priority for a design team inspection. In fiscal year 1997, funding is available for 12 design team inspections. Because the fiscal year 1997 inspections were planned prior to the 10 CFR 50.54(f) response review results, there is not a one-to-one correlation between the 11 design team inspections recommended through the 10 CFR 50.54(f) response review process and the 12 design team inspections that have been or will be conducted in 1997. However, of the 12 planned, five are included in the higher priority category. The staff will target the four of the six remaining higher priority sites for completion in fiscal year 1998. However, due to the need to avoid conflicts of interest with design team contractors two sites may not receive design team inspections. For the two affected sites, the staff will use the normal inspection processes to evaluate what alternative inspection would be most effective. For example, the staff's recently developed inspection initiative (Safety System Engineering Inspection) in conjunction with the vertical slice initiative (Safety System Functional Inspection) would likely provide an appropriate and effective alternative inspection method

for evaluating the effectiveness of design basis control programs and processes when necessary.

#### Insights Gained

Based on the review of licensee responses to the 50.54(f) letter, the staff concluded that while licensees had established programs and processes to maintain their facility s design bases, there was a need to implement plant-specific inspection followup activities. This determination was based upon the staff having identified: (1) instances in which licensees failed to reconcile regulatory performance with their assertions that their programs and processes were effective in maintaining their design bases, or (2) that there was a need to gain a better understanding or to validate a particular aspect of a licensee s programs and processes.

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#### COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections.

This paper has been coordinated with the Office of the Chief Financial Officer which has no objection to the resource estimates contained in this paper.

L. Joseph Callan  
Executive Director  
for Operations